

REMARKS

In the office action, the Examiner (1) rejected Claims 27, 31, 32, 34, 38, 40, 44, and 46 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 5,922,623 issued to Tsutsui et al. ("Tsutsui"), (2) rejected Claims 33, 39 and 50 under 35 U.S.C. § 103(a) as being unpatentable over Tsutsui, and (3) rejected Claims 9, 11, 28, 29, 35, 36, 41, 42, 45, 47 and 48 under § 103(a) as being unpatentable over Tsutsui in view of U.S. Patent No. 5,286,679 issued to Farnworth et al. ("Farnworth"). Reconsideration and allowance of the application, as amended, are requested.

The present application is generally directed to masks for use in vapor hydrogen fluoride etching, which allows etching of very small features with great uniformity. Claim 9 of the application is directed to a mask comprising a layer of patterned polyimide for vapor hydrogen fluoride etching. The Examiner rejected Claim 9 as being obvious over Tsutsui in view of Farnworth. The Examiner contends that Tsutsui discloses the use of WSi and gold layers that are resistant to vapor hydrogen fluoride, and which form a mask. The Examiner also states that Tsutsui discloses in col. 2, lines 10-25 that the mask can comprise a patterned photoresist that is used to pattern a tungsten layer. The Examiner acknowledges that Tsutsui does not teach that the photoresist comprises polyimide. Farnworth is, however, said to disclose photosensitive materials including polyimides in col. 6, lines 50-60. The Examiner states that the Tsutsui and Farnworth references are analogous art as they are drawn to patterning semiconductor layers using photosensitive and etching processes, and that it would have been obvious to one of ordinary skill in the art to use Farnworth's polyimide material in Tsutsui's mask.

In the first passage of Tsutsui cited by the Examiner (col. 2, lines 10-25), Tsutsui discloses a prior art method of selectively etching a metal film 9 "by means of the usual photolithography and dry etching method using a photoresist as a mask." No use vapor hydrogen fluoride etchant is disclosed or suggested here by Tsutsui.

In the second passage of Tsutsui cited by the Examiner (col. 5, lines 14-18), Tsutsui discloses the silicon film 6 is vapor phase etched by gases including a vapor of HF, and the silicon oxide film 6 is removed as shown in FIGURE 1(c). The Examiner contends that the WSi

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and gold layers 7, 8 form a mask with respect to this etching. The WSi and gold layers 7, 8 however are not used by Tsutsui as a "mask" because (1) they are not structured to enable any selective etching of the silicon film 6, and (2) they form part of the final structure as a gate electrode and are not later removed.

Neither cited teaching of Tsutsui is properly combinable with Farnworth. The first cited teaching of Tsutsui does not disclose or suggest use of vapor hydrogen fluoride etchant. Thus, even if this teaching is combined with Farnworth, each and every element of Claim 9 would not be present, making this an improper rejection under § 103. The second cited teaching of Tsutsui discloses WSi and gold layers 7, 8, which are not used by Tsutsui as a mask, much less as a photoresist mask. Thus, one skilled in the art would not look to any other reference for disclosing any particular type of a photosensitive mask.

Furthermore, Farnworth also does not suggest combination with Tsutsui. Farnworth is directed to a method for attaching a semiconductor die to a leadframe using a patterned adhesive layer. Farnworth teaches in col. 6, lines 50-61 that the adhesive layer could be formulated from photosensitive materials known generally as polyimide siloxanes. A mask is used to form the pattern on the adhesive photosensitive materials. The adhesive layer formulated from polyimide siloxanes is therefore not the mask. Accordingly, one skilled in the art would not consider combining the teachings of Farnworth relating to adhesive materials with that of Tsutsui.

Therefore, the teachings of Tsutsui and Farnworth are not properly combinable, and the rejection of Claim 9 and Claims 10-12, which depend on Claim 9 should be withdrawn.

Claim 27, 29-33, 35-40, and 42-45 specify a layer of material resistant to vapor hydrogen fluoride etchant comprises polyimide. These claims are also allowable over the combination of Tsutsui and Farnworth.

Claim 34 is directed to an etch resistant masking layer, which comprises a layer of material resistant to vapor hydrogen fluoride etchant having an opening therethrough to expose a portion of an underlying layer such that the portion can be etched by vapor hydrogen fluoride etchant. The Examiner rejected Claim 34 as being anticipated by Tsutsui. Tsutsui, however,

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does not disclose or in any way suggest an etch resistant masking layer resistant to vapor hydrogen fluoride etchant that has an opening therethrough to expose a portion of an underlying layer that can be etched by vapor hydrogen fluoride etchant. The Examiner contends that the WSi and gold layers form the claimed mask. However, the WSi and gold layers do not have any type of opening therethrough, much less an opening therethrough to expose a portion of an underlying layer that can be etched by vapor hydrogen fluoride etchant. Claim 34 and dependent Claims 35-39 are therefore not anticipated by Tsutsui. Claim 46 specifies a masking layer resistant to vapor hydrogen fluoride etchant having an opening therethrough. Claim 46 and dependent Claims 47-50 are also not anticipated by Tsutsui.

Claims 9-12, 27, 29-40, and 42-50 are pending in the present application. As the application is now believed to be in condition for allowance, issuance of a Notice of Allowance is respectfully requested.

Respectfully submitted,



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